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ABSTRACT

The booklet describes approaches used in the Union of Soviet Socialist Republics to prevent blindness. It contrasts conditions prior to 1917 (300 eye doctors mainly located in large cities and 2,000 hospital beds for the 300,000 totally blind and 7,000,000 people with trachoma) with conditions in 1971 when in the Ukraine alone there were 3,000 eye doctors and 10,000 hospital beds. It discusses development of a health delivery plan in 1920 which involved mobile groups and a later stationary network of antitrachoma institutions headed by the Helmholtz Eye Diseases Research Institute. It notes functions of six scientific research ophthalmological institutes, 100 medical institutes for training medical workers, research laboratories, scientific societies, and institutions such as children's eye hospitals. Glaucoma, which causes blindness, and nearsightedness, which leads to eye disabilities are cited as problems, preventions noted are examinations of the over-40-year old population and attention to favorable conditions for visual work. Children are said to receive eye examinations in preschool and schools. Research on eye damage is seen to have resulted in safety and sanitary measures in factories and on farms with subsequent reduction of eye damage by a factor of six. Mentioned among achievements are a state standard on protective eyeglasses, methods of locating alien bodies in the eye, treatment of eye burns, and new methods of surgery such as ultra sound surgery. (Photographs are included that show techniques used in ophthalmology.) (MC)

K.Trutneva

PREVENTION OF BLINDNESS IN THE USSR

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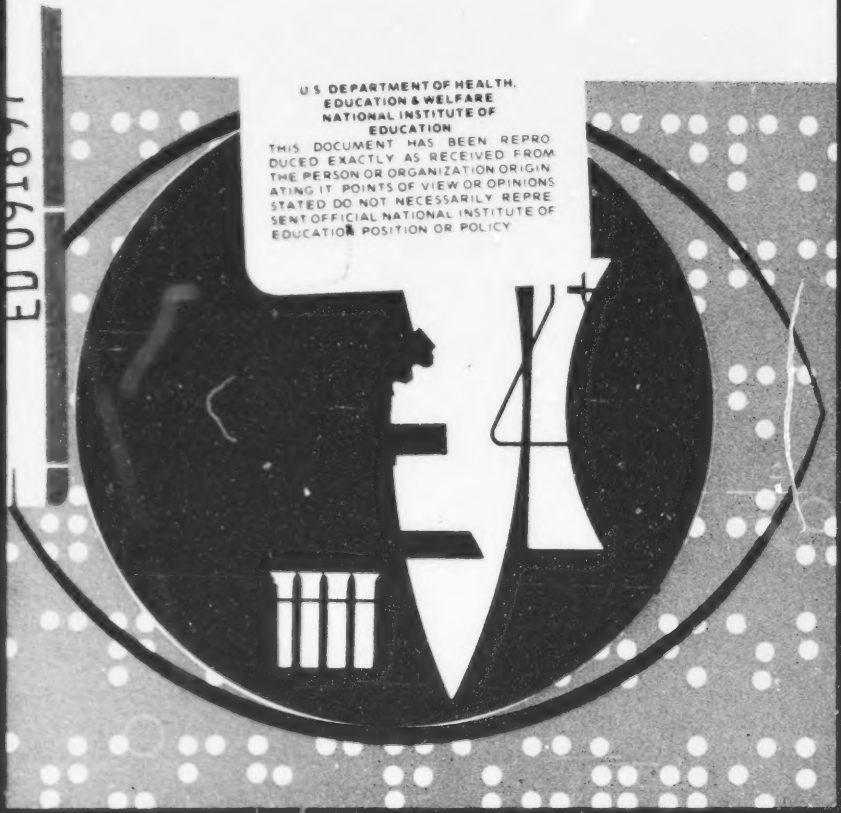

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THE ALL-RUSSIA SOCIETY FOR THE BLIND

PREVENTION OF BLINDNESS IN THE USSR

K. TRUTNEVA,

director of the Moscow Gelmgoltz Scientific-research institute of Eye Diseases

MATERIALS FOR THE SESSION
OF THE EXECUTIVE COMMITTEE
OF THE WORLD UNION
FOR THE WELFARE OF THE BLIND

MOSCOW—1972

Protection of people's eye-sight in our country is the matter of the state importance. The very first decrees of the Soviet government about peace and about land, decision about an eight-hour working day, regulations about social insurance, adoption of Code of labour law's played an important role in protection of life and health of the Soviet people.

In 1917 there were only 2,000 beds in Russia for eye disease cases and 300 eye-doctors (mainly general practicioners in large towns). In his well-known monography "Blindness in Russia" (1910) S. S. Golovin characterises blindness as the lot of the poor; socio-economic conditions, he goes on to say, is the rich soil for the spread of eye diseases.

In pre-Revolutionary Russia, blindness was a widespread phenomenon. It was engendered by three factors: cultural backwardness of the population, grave juridical and economic life conditions and lack of medical help. There were no eye-doctors in rural areas and peasants received occassional medical help from the eye groups which were formed from time to time on voluntary donations.

It is not accidental, therefore, that in Russia before the Revolution there were 300,000 absolutely blind people

and seven million suffered from trachoma. The main causes of blindness at the time were trachoma, smallpox, gonorrhoea, syphilis.

After the Revolution all sides of the state and cultural activity of the country were subjected to radical reshaping. Most favourable conditions were created for the development of science. This also concerned ophthalmology.

After the establishment of popular power the basic principles of the Soviet medicine were proclaimed: state generally accessible and free-of-charge qualified medical aid, unity of medical and sanitary effort, preventive measures as the main course in medicine.

The RSFSR People's Commissariat for Public Health regarded the organisation of fight against eye diseases among the most urgent tasks. In 1920 an eye-disease section was set up under the People's Commissariat for Public Health which elaborated a plan of complex measures for fighting trachoma and blindness on the territory of the Soviet Union. The plan also envisaged a wide-scale effort to prevent eye-diseases and blindness.

Of great importance at the time was organisation of specialised eye aid. Thus in 1922 the Trachomatose Institute was opened in Kazan; in 1930 the Girshman Institute of Eye Diseases in the Ukraine. In 1936 the Gelmholtz Institute of Eye Diseases was opened in Moscow and the Ukrainian Institute of Eye Diseases in Odessa.

Special scientific and research trachomatose centres were organised in the trachoma-ridden territories (Ufa, Ashkhabad, Gomel, Alma Ata).

The number of beds for patients with eye diseases, eye clinicls grew rapidly, eye-doctors also considerably increased in number.

At present 15,000 eye doctors provide ophthalmological

help for the population and the number of bed increased by 250 per cent as compared with 1917.

Here are a few more tell-tale facts: by 1971 in the Ukraine alone there were nearly 3,000 eye doctors and about 10,000 beds for eye patients. In the Kemerovo Region there are 200 eye-doctors today and over 600 beds. Eye doctors working in Siberia comprise two thirds of the number of eye doctors who functioned in tsarist Russia in 1913. There is hardly even a small town in Siberia today without its own eye dispensary and a rare rural district gets along without an eye-oculist.

In our capital, Moscow, there work at present 650 oculists, over half of them — at district polyclinics. In the years of Soviet Power the number of Muscovites who come to oculists for treatment has doubled. This goes to signify that the cultural level of the population has gone up and that medical aid, eye treatment in particular, has become accessible for one and every.

Specialised eye aid brought within close reach ensures timely qualified eye aid and allows to conduct on a broad scale complex measures for prevention of eye diseases.

It was exactly this and the all-round support of the measures conducted by the oculists, the party and Soviet organs, by the medical and public circles, efficient direction of the USSR and RSFSR Ministries for Public Health that helped to eradicate flare ups of trachoma, speedily and successfully. Whereas in the First Soviet years mobile eye disease groups were formed to fight trachoma, later on a stationary network of anti-trachoma institutions began to take shape whose aim was to fight for the complete and sound elimination of this disease.

All people suffering from trachoma underwent annual systematic treatment, medical and prevention institutions

were supplied with the latest antibiotics, sulfonamides and vaccines which radically improved eye treatment and made preventive measures against reccurent and new cases of trachoma more effective.

Pending the dicision of the Academy of Medical Sciences, Ministries for Public Health of the USSR and RSFSR the Moscow Gelmholtz Scientific and Research Institute of Eye Diseases headed all the methodological and organisational work of fighting trachoma in our country.

At present six scientific research ophthamological institutes in Moscow, Odessa, Ashkhabad, Alma Ata, Baku, Ufa are conducting scientific, therapeutic and organisational work in the field of ophthamotology and one hundred faculties of medical institutes are busy training medical workers in our country.

Besides a number of problematic laboratories has been created for further specialisation in the field of ophthamotology such as the laboratory of micro-surgery (The Second Moscow Medical Institute), the laboratory of the reconstructive-restoration eye surgery (Moscow Medical Stomatological Institute) the Glaucoma laboratory (Kuibyshev Medical Institute), the laboratory of the Eye Age Physiology in Children (The Second Moscow Medical Institute).

Scientific societies of ophthalmologists and the problematic commissions in ophthalmology under the Scientific Medical Councils of the Ministries of Public Health of the Russian Federation and the Ukrainian SSR guide and co-ordinate the ophthalmological aid, develop scientific problems in this field.

A harmonious system of organisation of ophthalmological aid to adults and children has been set up in the Soviet Union. Soviet Union has an extensive network of hospitals and dispensaries. Besides republican, regional, town, district eye hospitals there are eye departments at

the regional, territorial, republican and other hospitals. Medical and prevention institutions have been organised working in the most important fields of ophthalmology — glaucoma consultant rooms, night glaucoma dispensaries, rooms for children eye-sight protection and for correct selection of contact lenses. Children's eye hospitals were opened along with special sanatoriums for the treatment of patients with various eye diseases (glaucoma, TB-allergic diseases, squint, etc.), kindergartens and grounds for children with squint and amblyopia.

Specialisation is the characteristic trait of the Soviet period of ophthalmology just as of the rest of medical science. Among the new trends and developments which have appeared in ophthalmology children's ophthalmology is progressing at a satisfying pace.

Such fields as onco-ophthalmology, neuro-ophthalmology, roentgen-ophthalmology are in the process of intensive development. Much attention is paid to genetic problems in ophthalmology, congenital patology of the organ of sight, eye micro-surgery, optico-reconstructive surgery, introduction of allo-plastic materials in ophthalmology.

The public health budget which doubled in the last 10 years consolidated the prevention principle in the work of medical institutions, including ophthalmological service.

In the last years the method of dispensaries became the leading one of bringing ophthalmological help to adults and especially to children.

Today glaucoma is one of the main causes of blindness — the problem which commands great and unslacking attention throughout the world. Today scientific research has armed public health organs of our country in their practical work with effective methods of early diagnostics of this serious and insidious disease — glaucoma.

The system of active location and dispensarisation of the patients in the early stages of disease has been developed and extensively introduced in the practice of public health. The first anti-glaucoma dispensary was opened in 1913 at the faculties of eye diseases of the Odessa Medical Institute and in 1952 the country's first night dispensary began functioning at the Moscow Gelmholtz Scientific-Research Institute of Eye Diseases where patients with suspicion of glaucoma were examined.

Today the ophthalmological service has a large number of such hospitals and dispensaries in which patients with suspicion of glaucoma or with early stages of glaucoma are examined, taken under observation and given medical treatment.

Preventive examinations of the people over 40 at enterprises, offices and at polyclinics reveal about 1 per cent of those affected by glaucoma. This figure increases when examinations are conducted at general somatic hospitals, of people suffering from cardiovascular and endocrine disturbances (hypertonic diseases and diabetes).

It should be noted that as the measures of active revealing of glaucoma become more efficient with every year the number of spotted people with early stages of glaucoma grows whereas those with absolute stage of glaucoma diminishes.

Besides doctors-ophthalmologists doctors of other specialities, medical workers of various ranks and public organisations are drawn into the work of fighting glaucoma, actively discovering it in its early stages. To this purpose seminars are organised at which they get acquainted with glaucoma and are taught to measure intraocular pressure. The Gelmholtz Institute has developed and introduced into broad practice an indicator of intraocular pressure for mass examination for glaucoma.

The work of mass discovery of glaucoma in the RSFSR became particularly sweeping after the RSFSR Ministry for Public Health published in 1964 an instruction "On Measures in Fighting Glaucoma".

The ophthalmologists after widely aprobating the method of active discovery of glaucoma have specified and extended the notion about pathogenic mechanisms, clinic classifications and oriented surgery of glaucoma (A. Y. Bunin, T. I. Yeroshevsky, M. M. Krasnov, A. P. Nesterov and others).

Modern Soviet-made electronic apparatuses — tonograph, pletizmoophalmograph, reoophthalmograph, etc. — are used in conducting delicate examinations for treatment diagnostics and control.

The workers of the Gelmholtz Institute suggested and introduced method of medicocamentose treatment of glaucoma in order to stimulate visual functions and dehydration.

Whereas glaucoma occupies first place among the diseases causing blindness, complicated nearsightedness ranks first in the Russian Federation leading to eye disability. The disease deprives people of capacity for work or seriously cuts down its efficiency in young or adult age, i. e. at the time when energy and creative abilities are at a peak. Hence the fight against nearsightedness in our country has been placed on a par with state problems demanding active and broad-scale measures for prevention nearsightedness and its complications.

A considerable contribution in the field of the study of ethiology, pathogenesis and treatment of nearsightedness, as well as squint and ambliopya was made by the department of protection of children's eye-sight headed by Professor E. S. Avetisov at the Gelmholtz Institute. He put forward a theory of origin of nearsightedness in peop-

le with weakened accomodation which has already been proved in practice.

The measures of prevention of nearsightedness presuppose the creation of the most favourable conditions for visual work.

Oculists should draw into the work of prevention of nearsightedness school doctors, hygienists, teachers, workers of houses of sanitary education and also of the safety of labour service.

In the last 15—20 years an organisation of ophthalmological help to children showed marked improvement and is continuing to be perfected. Prevention of diseases of the organs of sight, especially in children, is the primary obligation of each ophthalmologists.

It has been established that well-ogranised examination of pre-school children, schoolchildren, dispensary observation at any traces of glaucoma brought positive results in the prevention of eye distrubances, nearsightedness in particular.

Special mention should be made of the concern in our country for the blind and partially blind children. Special conditions have been created (lighting, various appliances fitted to their desks, special print and so on) at schools where they study and where they are kept under medical control and receive treatment.

In a number of cases after a complex surgical-plopthomedicamentose treatment some of the children were transferred from schools for blind to schools for children with poor sight. Special merit in this noble effort goes to the Gelmholtz Institute.

Among the basic causes of disability and blindness is damage of the organ of vision. Therefore, study of the damages of eye-sight of various kinds, their consequences

and the development of preventive measures is an important part of ophthalmology.

Introduction of the comprehensive mechanisation and auxiliary processes, extensive automation of production, building of new enterprises with all the requirements of the labour safety technique being effected tend to diminish damages to the organ of vision.

The analysis of research has shown that as a result of the general effort of doctors and public organisations together with the administration of an enterprise or farm cases of damage to the organ of vision can be minimised.

Radical improvement of labour conditions, obligatory use by the workers collective and individual protection, wide-scale sanitary and educational work, immediate and timely medical aid considerably decreased the percentage of production traumas. Thus the combined effort of the workers of the Gelgholtz Institute and the oculists and party and Soviet organisations of the Ust-Labinsky Region in the Krasnodar Territory diminished by six times the cases of damage to the eye in the farm workers.

Particular attention in our country is paid to the means of individual protection the use of which brings the number of damages to the eye in production down by 50 per cent. In this connection mention should be made of the initiative of the Golmholtz Institute in developing the country's first State Standard on protective eye-glasses (M 9801—62). At present the work is under way on a new State Standard which will take into account the necessity of creating optically-efficient, corigible protective eye-glasses.

It is important to perfect the methods of location and localisation of the alien bodies in cases of penetrating damage to the eye (roentgenography, strereoroentgenography ultra-sound metheds, roentgenography with direct en-

largment detection and localisation of an alien body by non-contact methods and so on), as well as sophisticated methods of treatment of the damaged eye tunic (application of stitches of various nature, use of various glues, etc.).

Particular note should be made of the works devoted to eye burns, conducted at the Filatov Institute of Eye Diseases and Tissue Therapy in Odessa. The round stalk in skin transplantations and the method of transplantation of cornea of Academician V. P. Filatov are world-known. The later method turned out to be very effective in fighting cases of blindness from the walleys. Its further development gave birth to the method of the cornea alloplastic (keratoplastic prosthesis, used in particularly grave cases when keratoplasty failed to give positive results. This method is used in several ophthalmological institution of our country.

Speaking about the use of plastic material in ophthalmology, mention should be made of contact lenses used for optical correction and with medical purposes in cases of keratocone. Today our country has 20 laboratories engaged in manufacture and selection of contact lenses; their number will increase in the near future. In special cases (chiefly in cases of one-sided aphakia when other means of vision correction failed) use is made of intraocular lenses, the so-called man-made crystaline lenses (Moscow Stomatological Medical Institute, the Second Moscow Medical Institute, Gelmholtz Institute).

Several ophtholmological institutions use alloplastic materials to form conjunctiva stump after enucleation, in cases of disease of lacrimal grooves, and in anti-glaucoma-tose operations. Lately refraction is being changed by way of keratomalacia and keratophakia.

Mention should also be made of the use of new me-

thods of surgery and diagnostics — ultra-sound surgery and use of light-guides in opthalmology for diagnostical and surgical purposes (surgery of cornea, peeling off of retina, new growth o fchoroid, lacrimal organs, intraocal alien bodies, etc.).

As a result of the creative effort of ophthalmologists of the two research institutions — the Gelmholts Institute in Moscow and the Academician Filatov Institute in Odessa — as well as the engineers and physicians of a designing bureau a Soviet-made quantum ophthalmocoagulator OK—1 has been developed for conducting bloodless surgery in cases of peeling off of retina, neoplasm of choroid and for cases of optical iridectomy. The apparatus has already been introduced into practice and patented in a number of foreign countries following its succussful demonstration et several international exhibitions.

The works of scientists of the Gelmholtz Institute, Moscow Clinics of Eye Diseases, the Vladimirsky Regional Scientific-Research Institute in Moscow, the Second Moscow Medical Institute facilitate diagnostics of swellings of the organ of vision with the help of tracer atoms.

At present a complex method of therapy (ray, surgical, chemical-therapeutical and contact radiation) is used in cases of malignant neoplasm of retina.

Method of kriotherapy is coming into wide use in ophthalmology (krioextraction of catarect, peeling off of retina, in cases of removal of intraocular tumors, etc.).

Soviet ophthalmologists have developed and introduced into practice new methods of complex clinical and laboratory diagnostics and therapy of virus eye diseases (cytological, serological, immunological with the use of fluorescent antibodies; DNA, interferons, interferonogens.

Among numerous and grave diseases of the organ of vision we must mention the vascular eye pathology —

changes in eye organs in cases of hypertonic disease, diabetes, atherosclerosis anda large group of various distrophic and degenerative changes of retina. Prevention of pathological changes of the organ of vision here should be decisive in the ophthalmological science and practice. Scientists today tend to favour pathogenic treatment of these diseases (for instance, use of RNA in a complex treatment of tapetorethinal dystrophy as a an attempt of substitute therapy).

A considerable persentage of vision disability is due to the pathology of crystalline lens — cataract. Some of its forms developing in youth or in middle ages doom a person to a limited or complete disability especially with inborn cataracts. In such cases ophthalmologists orient on surgical therapy of cataract without waiting for its maturing especially in able-bodied persons whose faulty vision is insufficient for their labour activity. Improved surgical methods, high skill of ophthalmo-surgeons and various methods of correction of the postoperative aphakia make such operations feasible.

Scientific workers of the Gelmholtz Institute suggested medicamentose method of therapy at the initial stages of certain kinds of cataracts (with the use of eye drops containing cystine, named "vitsein" by the Pharmacological Committee of the USSR Ministry of Public Health). This method has been widely introduced into practice since it allows to contain further progress of cloudiness of the crystalline lens and in a number of cases diminishes cataract.

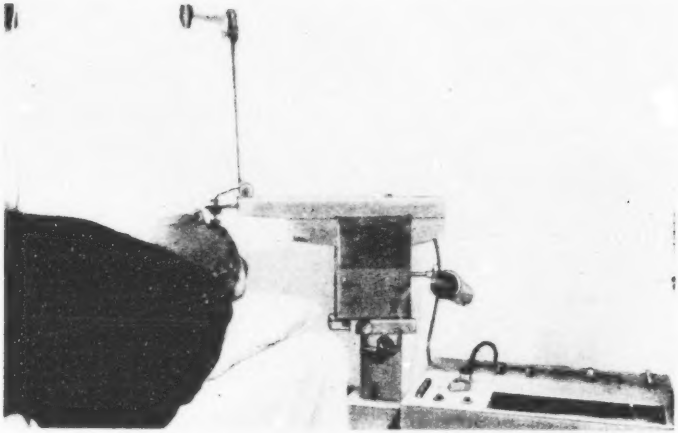
From the above-mentioned prevention, diagnosis and therapy methods developed and suggested by the Soviet ophthalmologists some are already used widely in practice others, despite early appearance are in the stage of their further study.

It is gratifying that a numerous army of ophthalmologists actively work on the development of the new and perfectioning the already existing instruments and apparatuses and tools since at the present level of development of medical science in general and ophthalmological in particular delicate, precise examinations and operations are impossible with the material basis to match.

In our country we have all the conditions for conducting active prevention of disability and carrying out complete or partial medical rehabilitation of persons who had lost their capacity for work through partial loss of sight.

The analysis of the many-sided work conducted by the Soviet ophthalmologists, as compared with the data obtained in the course of studies of the analogous problems abroad, testify to the fact that the Soviet ophthalmology, basing on the state system of the people's health protection, is in the vanguard of science and practice. It stands out in a more favourable light in the scope and thoroughness of research work and especially in the effectiveness of practical use of the achievements of science in protecting people's eye-sight as compared with medical business approach in the capitalist countries.

Soviet ophthalmologists will score new achievements in their noble work of safeguarding people's health and vision by raising the efficiency of their research work, speedy introduction of scientific achievements into practice and by realising basic directions of the Soviet public health service — prevention of disease and participation of the working people in public health matters.



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Examining the dynamics of the chamber moisture by the tonography method. The tonograph was designed by Y. I. Sakharov, A. P. Nesterov and N. V. Kudashev

Examining the pulse blood volume in the eye (or examination of blood circulation in the eye) by the ophthalmopletizmography. The ophthalmopletizmograph was designed at the Moscow Research Institute of Eye Diseases named after Gelmholtz and the Research Institute of the Medical Instrument Making

At a consulting-room of the orthopedic treatment of squint. Exercises on the synoptophor are conducted by a nurse-orthopedist. The apparatus was developed at the All-Union Research Institute of the Medical Instrument Making and the Moscow Research Institute of Eye Diseases named after Gelmholtz

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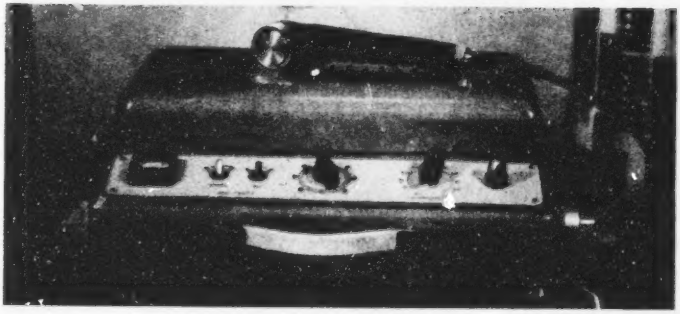
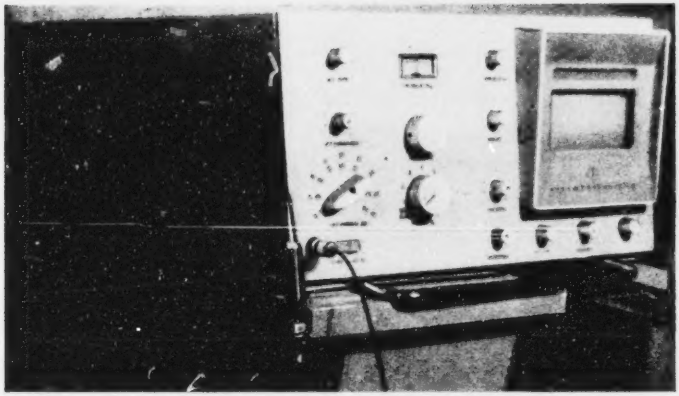
An eye of the patient with cornea contact lens

Doctor-oculists fits contact lens in the eye of the patient with highly complicated nearsightedness (over 20,0 D)

Various types of Soviet-made protective eye-glasses

Soviet-made apparatus for treatment of various eye diseases — YTH-1





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Soviet-made Echoophthalmograph for diagnosing eye diseases with the help of ultra-sound

Diagnostical ultra-sound examination of the eye with the help of Soviet-made Echoophthalmograph

Ultra-sound treatment of the diseased eye with the help of the Soviet-made apparatus YTH-1

1/2 Tracer atom indication of ophthalmological cases with the help of the Soviet-made sensor CBM-12 and radiocounter Kometa

A set of ophthalmosurgical instruments with fibro-optics. Lighting is supplied to the tip of an instrument along the light-fibre. A cold local bright lighting is created of a surgical field hardly accessible for ordinary lighting

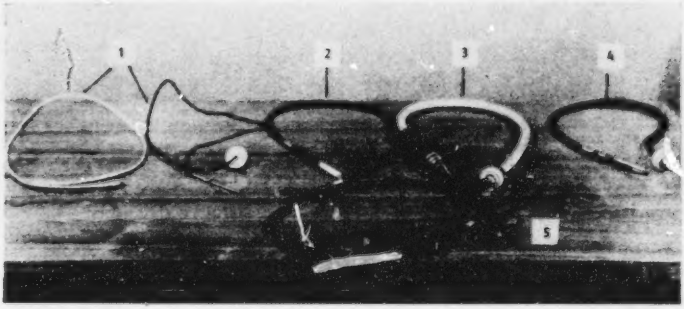
1. Needles for lighting the eye apple from the inside. The needles are used to inject silicone

2. A scalpel for incision of tissues of the eye apple posterior

3. Diaphanoscope for the bright forced transpupillar and transscleral lighting of the eye apple. The instrument is used for diagnostics of intraocular swellings and for projection of the shadows of the intraocular fragments onto the sclera

4. Pincers for removal of alien bodies forom the vitreous body of the eye apple front chamber

5. Lid retractor for lightjng of the eye apple posterior. Th> instrument is used in operations in connection with peeling-off of retina and diascleral removal of alien bodies from the eye posterior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Bloodless operative intervention in connection with peeling-off of retina with the help of the Soviet-made optical quantum generator — laser OK-1 (Developed by the designing bureau in co-operation with the Moscow Research Institute of Eye Diseases named after Gelmholtz and the Odessa Research Institute of Eye Diseases and Tissue Therapy named after Academician Filatov)

General view of ectoprosthesis attached to the rim of the eye-glasses

Condition of patient S. after exeneration in connection with neoplasm

The same patient with the ectoprothesis attached to the eye-glasses rim

The same patient with the ectoprothesis glued to skin with spirit-gum

Patient M. with bilateral anophthalm after measels from which she suffered at the age of three. Have been operated (10 times) time and again without any effect

The same patient with bilateral octoprothesis